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Research on Regional Disparity and Its Influential Factors of Input-Output Coefficients

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Abstract

Input-output coefficients of various regions differ greatly; however, so far, time-series analysis has been widely applied to direct input coefficients, which lacks systematic cross-section research, let alone study on influential factors of their regional disparity. Based on national and 30 regional input-output tables of China (2002-2007), this paper concentrates on important input-output coefficients. Descriptive statistics analysis is firstly done from three aspects: great change in coefficients at the regional level from 2002 to 2007, comparison between coefficients at the national level and weighted coefficients at the regional level, and classification of scatter diagrams of coefficients. Then take coefficients with normal scatterplot distribution whose column sectors belong to industry as examples, by selecting a series of relative indices from scale, technical characteristics, ownership composition and sub-sector structure, regression models are established to find out main influential factors of input-output coefficients, on the basis of which further economic explanation can be made.

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Keywords: input-output coefficients; influential factors; regional disparity; regression models

1. Introduction

Direct input coefficient can also be called technological coefficient, input coefficient or input-output coefficient, which is the most important fundamental concept in the analysis of input-output. It can reflect the technological and economic linkage between sectors under a certain level of technique.

So far, relevant study on input-output coefficients can be divided into four categories which include the analysis of input-output coefficients from the view of time series, identification of important coefficients in input-output model, update and revise of input-output coefficients and the importance of input-output coefficients. As far as the analysis of input-output coefficients from the view of time series, for example,

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Gheorghe, Marius and Camelia (2010) tested the time-stability of input-output coefficients by using the IO statistical tables of Roman for 2000 and 2006[1]. In Wang Yupeng, Xu Jian and Wu Can (2010), the general trends of the direct consumption coefficient change are summarized by the comparison of Chinese series input-output tables from 1992 to 2000[2]. As for the identification of important coefficients, for instance, Sonis and Hewings (1992) put forward the notion of a "field of influence" as the basis for interpreting the effects of coefficient change[3]. In Xu Jian (2003), on the basis of critical review of present ideas and approaches, a new approach identifying average inverse ICs was brought forward and applied to actual Input-Output table[4]. As to the update and revise of input-output coefficients, Kurt and Gerold (2004) updated the input-output coefficients within a large-scale disaggregated econometric macro-model of the Austrian economy by using a biproportional method[5]. For the importance of input-output coefficients, Shuntaro, Makoto and so on (2000) analyzed both sectoral intermediate inputs and the value added by using 45 input-output tables to discover a standard pattern of the changes in the input-output coefficients as the economy developed[6].

From the above summarization, we can see that time-series analysis has been widely applied to input-output coefficients, which lacks systematic cross-section research combined with time-series analysis, let alone study on influential factors of their regional disparity. But research on regional difference and its influential factors is of great importance. On one hand, study on input-output difference between sectors from different regions from the perspective of direct input coefficients is helpful to recognize the difference in regional development fundamentally, which can promote balanced development between regions and is beneficial to relevant policy-making. On the other hand, study on the difference and regularity among input-output structures in different regions contributes to the update and revise of regional input-output tables.

This paper is organized as follows. Section 2 gives a detailed introduction of the data we are using. Based on national and 30 regional input-output tables of China (2002-2007), descriptive statistics analysis is done in Section 3 from three aspects: great change in coefficients at the regional level from 2002 to 2007, comparison between coefficients at the national level and weighted coefficients at the regional level, and classification of scatter diagrams of coefficients. Section 4 takes coefficients with normal scatterplot distribution whose column sectors belong to industry as examples, by selecting a series of relative indices from scale, technical characteristics, ownership composition and sub-sector structure, regression models are established to find out main influential factors of the regional difference of input-output coefficients. Section 5 contains summary and conclusions.

2. Distribution of Regional Disparity

For our empirical analysis, we have studied the regional disparity and its influential factors by reference to the national input-output table and a series of regional input-output tables for a 30-division of the Chinese economy. The original tables were published in a version recording 42 sectors with current producer prices, for the years 2002 and 2007.

According to the current sectoral classification, there are 1764 coefficients in total. Without selection, there are too many coefficients to find the regularity of regional disparity. In addition, values of a part of coefficients are so small that these coefficients won't receive much attention to ensure their accuracy during the process of update and revise. Therefore, the selection of input-output coefficients for the following analysis will be done at national level.

Given that this paper concentrates on the regional disparity and its influential factors of input-output coefficients, a series of methods on the identification of important coefficients are not adopted. Here two aspects are taken into consideration: one is the size of the coefficient value; the other is the percentage of the selected coefficients. Finally, this paper focuses on coefficients whose values are above 0.05 according to the national input-output table of 2002. There are 103 selected coefficients and such coefficients account for less than 10%.

In this section, descriptive statistics analysis is done from three aspects: great change in coefficients at the regional level from 2002 to 2007, comparison between coefficients at the national level and weighted coefficients at the regional level, and classification of scatter diagrams of coefficients.

2.1. Great Change in Coefficients at the Regional Level from 2002 to 2007

Firstly, Figure1 and Table1 provide a brief overview of the distribution of change in coefficients at the regional level from 2002 to 2007. Figure1 gives the histogram of absolute change of 103 coefficients at the regional level from 2002 to 2007. Some descriptive statistical analysis of the absolute change is presented in Table1. At first sight, we can see that the majority of absolute change is intensively distributed within absolute value 0.05, which accounts for 64%. In addition, normality test is applied to the distribution shown in Figure1, which turns out to be left-skewed abnormal distribution with an obvious peak.

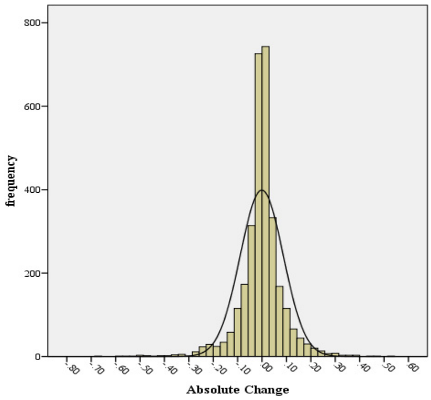

Fig. 1. Absolute change of 103 coefficients at the regional level from 2002 to 2007

Table1. Descriptive statistical analysis of the absolute change

Statistics	Value	Statistics	Value
Mean	-0.0012	Standard Deviation	0.0883
Median	0.0002	Interquartile Range	0.0619
Minimum	-0.6856	Skewness	-0.6214
Maximum	0.5392	Kurtosis	7.4290

As for great Change in coefficients at the regional level from 2002 to 2007, there are two extreme cases: (a) The values of coefficients in 2002 equal zero, but are above 0.05 in 2007; (b) The values of coefficients in 2002 are above 0.05, but equal zero in 2007. These two extreme cases are summarized in Table2.

Table2. Extreme case (a) & (b)

Extreme Case	Area	Frequency	Province	Coefficient
a	Northeast	2	Liaoning	a1,21
			Heilongjiang	a1,21
	East	1	Fujian	a3,11
	West	4	Inner Mongolia	a30,9
			Chongqing	a4,4
			Qinghai	a1,7;a11,24
b	Northeast	4	Jilin	a30,10;a30,21;a30,31;a35,35
	East	9	Hebei	a35,35
			Shanghai	a12,5;a27,5
			Fujian	a1,21;a35,35
			Guangdong	a23,2
			Hainan	a23,2;a2,23;a2,24
	West	12	Inner Mongolia	a35,35
			Guangxi	a35,35
			Shanxi	a30,8;a30,21;a30,24;a30,31
			Gansu	a35,35
			Qinghai	a1,9;a14,18;a18,19;a35,35
			Ningxia	a14,21
	Middle	4	Anhui	a35,35
			Jiangxi	a2,24
			Hubei	a35,35

2.2. Comparison between Coefficients at the National Level and Weighted Coefficients at the Regional Level

The formulation of weighted coefficient is as follows:

$$a_{ij}^{w} = \frac{x_j^1}{x_j} a_{ij}^1 + \frac{x_j^2}{x_j} a_{ij}^2 + \cdots + \frac{x_j^{30}}{x_j} a_{ij}^{30} \qquad i, j = 1, 2, \cdots, 42 \tag{1}$$

Where a_{ij}^{w} denotes the weighted coefficient, a_{ij}^{m} denotes the direct input coefficient of region m, x_j denotes the output of sector j, x_i^n denotes the output of sector i of region n.

Figure2 and Figure3 give the scatterplots of 103 coefficients at the national level and weighted coefficients at the regional level for the years 2002 and 2007, in which x axis denotes the values of coefficients at the national level and y axis denotes the values of coefficients at the regional level. In addition, diagonal divides the scatterplot into two parts. The dots in the upper part indicate coefficients whose values at the weighted level exceed that at the national level; accordingly, the dots under the diagonal refer to coefficients whose values at the weighted level are less than that at the national level. What's more, the closer to the diagonal, the more similar for values of coefficients at the national and weighted level.

In 2002, there are 54 coefficients whose national values are bigger than their weighted values. The same circumstance occurs to 64 coefficients in 2007. From 2002 to 2007, 58 coefficients show the same changing tendency in their national and weighted values, of which 34 coefficients decrease together. It can be easily found that the difference between national level and weighted level is narrowing from 2002 to 2007.

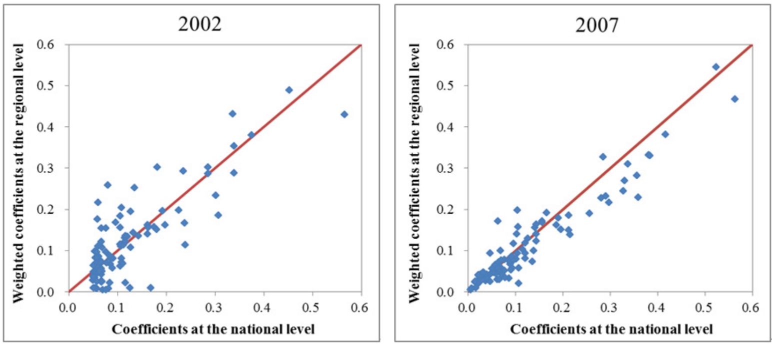

Fig. 2. Scatterplot of coefficients at the national and weighted level in 2002 & 2007

2.3. Classification of Scatter Diagrams of Coefficients

The scatter diagrams of 103 coefficients are divided into five categories: Group1 includes scatterplots with relatively normal distribution; Group2 contains scatterplots with relatively decentralized distribution; a coefficient whose national value exceeds all values at regional level is called an outlier, and such coefficients are embodied in Group3; Group4 denotes the scatterplots whose dots are close to the x axis and y axis; as for Group5, it consists of scatterplots with some other special outliers.

Table3. Summary of classification of scatter diagrams

I	II		III	IV	V	
a1,1	a1,7	a19.20	a1,26	a1,21	a11,27	a27,28
a1,31	a1,9	a2,23	a10,28	a10,21	a12,13	a30,8
a1,6	a10,34	a20,20	a11,4	a11,24	a12,18	a32,27
a10.10	a10,39	a23,25	a18,29	a12,38	a12,20	a6,31
a12,1	a10,41	a23,4	a18,36	a14,21	a12,8	a6,41
a12,10	a12,19	a27,5	a19,34	a2,24	a12,9	
a12,12	a12,21	a3,11	a19,36	a21,21	a14,16	
a12,16	a12,40	a30,10	a26,28	a27,35	a14,17	
a12,17	a12,5	a30,21	a7,38	a30,24	a14,20	
a13,13	a12,7	a30,31		a30,9	a15,15	
a13,26	a14,14	a31,42		a31,35	a18,18	
a27,27	a14,15	a4,4		a32,30	a18,19	
a4,14	a14,18	a7,7		a32,32	a18,20	
a5,13	a14,26	a7,8		a32,33	a19,29	
a6,1	a15,26			a33,42	a23,13	
a6,6	a16,16			a35,35	a23,14	
a8,8	a16,17			a7,21	a23,2	
a9,9	a17,17				a26,39	
	a17,27				a27,13	
	a19,19				a27,24	

3. Regression Models on Influential Factors of Regional Disparity

From what has been discussed above, we can see that regional disparity does exist among input-output coefficients. Therefore, finding out some common influential factors is beneficial from both theoretical and practical point of view, on the basis of which further economic explanation can be made. So this section takes coefficients with normal scatterplot distribution whose column sectors belong to industry as examples, and there are 12 coefficients in all. More details about these coefficients are given in Table4. By selecting a series of relative indices from scale, technical characteristics, ownership composition and sub-sector structure, regression models are established.

Table4. Details about the 12 coefficients

Row Sector	Column Sector	Coefficient
Agriculture, Forestry, Animal Husbandry & Fishery	Manufacture of Foods and Tobacco	a1,6
Manufacture of Foods and Tobacco	Manufacture of Foods and Tobacco	a6,6
Manufacture of Textile Wearing Apparel, Footwear, Caps, Leather, Fur, Feather(Down) and Its products	Manufacture of Textile Wearing Apparel, Footwear, Caps, Leather, Fur, Feather(Down) and Its products	a8,8
Processing of Timbers and Manufacture of Furniture	Processing of Timbers and Manufacture of Furniture	a9,9
Papermaking, Printing and Manufacture of Articles for Culture, Education and Sports Activities	Papermaking, Printing and Manufacture of Articles for Culture, Education and Sports Activities	a10,10
Chemical Industry	Papermaking, Printing and Manufacture of Articles for Culture, Education and Sports Activities	a12,10
Chemical Industry	Chemical Industry	a12,12
Mining and Processing of Non-metal Ores	Manufacture of Non-metallic Mineral Products	a5,13
Manufacture of Non-metallic Mineral Products	Manufacture of Non-metallic Mineral Products	a13,13
Mining of Metal Ores	Smelting and Rolling of Metals	a4,14
Chemical Industry	Manufacture of General Purpose and Special Purpose Machinery	a12,16
Chemical Industry	Manufacture of Transport Equipment	a12,17

3.1. Influential Factors

Given that direct input coefficients can reflect the technological and economic linkage between sectors under a certain level of technique, a series of factors may influence their size, such as technological level, management level, sub-sector structure, relative change of price, utilization of production capacity and so on. Combined with the characteristics of industry, finally, we will select a series of relative indices from scale, technical characteristics, ownership composition and sub-sector structure, on the basis of which regression models can be established.

As we all know, economies of scale mean that the cost of production and management will decrease with the increase of the scale, which closely related to the technological level. The characteristics of technology directly affect the size of direct input coefficients. As for the ownership of composition, we should admit that, in fact, economic structural reform of China is a process of optimization of the composition in ownership, which promotes the sustainable growth of the economy. As far as the sub-sector structure is concerned, it differs greatly. Take $a_{1,6}$, $a_{10,10}$, $a_{12,12}$ as examples, their sub-sector structures are shown in Table5, Table6 and Table7. Thus, different proportion of sub-sector output will be a key factor for regional disparity among input-output coefficients.

Table5. Sub-sector structure of a1,6

Row Sector \ Column Sector	Processing of Agricultural Foods and Byproducts	Manufacture of Foods	Manufacture of Drinks	Manufacture of Tabacco
Agriculture	0.3230	0.1334	0.1496	0.0980
Forestry	0.0011	0.0096	0.0020	0.0000
Animal Husbandry	0.1337	0.0930	0.0091	0.0000
Fishery	0.0648	0.0057	0.0009	0.0000
Services for Agriculture, Forestry, Animal Husbandry & Fishery	0.0000	0.0000	0.0000	0.0000
Agriculture, Forestry, Animal Husbandry & Fishery	**0.5226**	0.2417	0.1615	0.0980

Table6. Sub-sector structure of a10,10

Row Sector \ Column Sector	Manufacture of Paper and Paper Products	Printing, Reproduction of Recording Media	Manufacture of Articles for Culture, Education and Sports Activities
Manufacture of Paper and Paper Products	0.2852	0.3777	0.0586
Printing, Reproduction of Recording Media	0.0095	0.0408	0.0066
Manufacture of Articles for Culture, Education and Sports Activities	0.0001	0.0002	0.0253
Papermaking, Printing and Manufacture of Articles for Culture, Education and Sports Activities	0.2948	**0.4187**	0.0906

Table7. Sub-sector structure of a12,12

Row Sector \ Column Sector	Manufacture of Chemical Materials and Products	Manufacture of Medicines	Manufacture of Chemical Fiber	Manufacture of Rubber	Manufacture of Plastic
Manufacture of Chemical Materials and Products	0.3201	0.0698	0.2885	0.2788	0.3864
Manufacture of Medicines	0.0021	0.1756	0.0004	0.0003	0.0012
Manufacture of Chemical Fiber	0.0041	0.0006	0.2092	0.0213	0.0053
Manufacture of Rubber	0.0025	0.0013	0.0012	0.1158	0.0097
Manufacture of Plastic	0.0240	0.0197	0.0218	0.0140	0.2361
Chemical Industry	0.3528	0.2671	0.5210	0.4302	**0.6387**

This paper selects a series of relative indices from scale, technical characteristics, ownership composition and sub-sector structure, and their details are listed in Table8.

Table8. Details about a series of indices

Influential Factors	Indices
Scale	regional output of column sector (output) average size for industrial enterprises above designated size of column sector (assize) percentage of output for industrial enterprises above designated size of column sector (outputr)
Technical Characteristics	capital-labor ratio for industrial enterprises above designated size of column sector (clr) capital-output ratio for industrial enterprises above designated size of column sector (cor) R & D investment for industrial enterprises above designated size of column sector (rd)
Ownership Composition	percentage of output for state-controlled industrial enterprises above designated size of column sector (nr) percentage of output for foreign-funded industrial enterprises above designated size of column sector (fr)
Sub-sector Structure	a1,6: percentage of output for industrial enterprises above designated size of Processing of Agricultural Foods and Byproducts (pr) a10,10: percentage of output for industrial enterprises above designated size of Printing, Reproduction of Recording Media (pr) a12,10: percentage of output for industrial enterprises above designated size of Manufacture of Articles for Culture, Education and Sports Activities (pr) a12,12: percentage of output for industrial enterprises above designated size of Manufacture of Plastic (pr) a12,16: percentage of output for industrial enterprises above designated size of Manufacture of Special Purpose Machinery (pr) a12,17: percentage of output for industrial enterprises above designated size of Manufacture of Other Transport Equipment (pr) a13,13: percentage of output for industrial enterprises above designated size of Manufacture of Products of Cement and Plaster (pr) a4,14: percentage of output for industrial enterprises above designated size of Smelting of Non-Ferrous Metals and Manufacture of Alloys (pr) a5,13: percentage of output for industrial enterprises above designated size of Manufacture of Pottery and Porcelain (pr) a6,6: percentage of output for industrial enterprises above designated size of Manufacture of Foods (pr) a8,8: percentage of output for industrial enterprises above designated size of Manufacture of Leather, Fur, Feather(Down) and Its Products (pr) a9,9: percentage of output for industrial enterprises above designated size of Processing of Timbers, Manufacture of Wood, Bamboo, Rattan, Palm and Straw Products (pr)

3.2. Regression Models

This paper focuses on regional disparity of input-output coefficients, and we aim to explain it and find its influential factors. Therefore, despite the panel data this paper uses, we prefer multiple linear regression model to fixed-effect model and random-effect model. Table9 provides details of the 12 regression models.

Table9. Detailed results of the 12 regression models

Variable	a1,6		a10,10		a12,10		a12,12		a12,16		a12,17	
	Parameter Estimate	P Value	Parameter Estimate	P Value	Parameter Estimate	P Value	Parameter Estimate	P Value	Parameter Estimate	P Value	Parameter Estimate	P Value
Intercept	0.4012	<.0001	0.2400	0.0003	0.3359	<.0001	0.2300	0.0093	0.0196	0.0957	0.0548	0.0006
output	-0.0001	0.6614	0.0000	0.1799	0.0000	0.1345	0.0003	0.0801	0.0000	0.4785	0.0000	0.6084
asize	-1.3962	0.0075	0.0000	0.7671	0.0000	0.2889	-0.5638	0.3480	0.0000	0.4201	0.0000	0.2658
outputr	-0.0592	0.3621	0.0486	0.4565	0.0695	0.2688	0.1000	0.2643	-0.0005	0.9676	0.0222	0.1249
clr	580.1519	0.1058	-0.0001	0.9216	0.0003	0.8328	89.3184	0.6238	-0.0011	0.2768	-0.0010	0.3025
cor	-0.1	0.2937	-0.1102	0.0250	-0.1374	0.0032	-0.1208	0.0253	0.0177	0.2011	-0.0108	0.1169
rd	0.1877	0.0627	0.0000	0.9745	0.0000	0.9068	-0.0407	0.4203	0.0000	0.2231	0.0000	0.2320
nr	-0.1237	0.1635	0.0706	0.5117	0.0539	0.6122	0.1111	0.2408	-0.0212	0.1626	-0.0305	0.1194
fr	-0.27	<.0001	-0.0380	0.6128	0.0666	0.4124	0.0963	0.1995	0.0084	0.5607	0.0043	0.8139
pr	0.2594	0.0035	0.1514	0.0551	-0.3186	0.0204	0.2796	0.0678	0.0162	0.2955	-0.0070	0.7710
R-Square	0.5668		0.3750		0.3961		0.5260		0.2432		0.2398	
Adj R-Sq	0.4889		0.2625		0.2875		0.4407		0.1070		0.1030	
F Value	6.17		3.33		3.64		7.27		1.79		1.75	

Variable	a13,13		a4,14		a5,13		a6,6		a8,8		a9,9	
	Parameter Estimate	P Value	Parameter Estimate	P Value	Parameter Estimate	P Value	Parameter Estimate	P Value	Parameter Estimate	P Value	Parameter Estimate	P Value
Intercept	0.0927	0.3241	0.1003	0.0388	0.0406	0.2236	0.6072	<.0001	0.1155	0.0855	0.1714	0.0090
output	0.0000	0.0520	0.0000	0.7012	0.0000	0.6266	0.0000	0.8540	0.0000	0.3881	0.0000	0.8304
asize	-0.0000	0.5773	0.0000	0.0149	0.0000	0.6463	0.0000	0.0168	0.0000	0.9066	0.0000	0.1894
outputr	0.0218	0.7672	-0.0456	0.3117	-0.0225	0.4140	-0.0889	0.1993	0.0312	0.5820	0.0185	0.7566
clr	0.0022	0.5733	-0.0003	0.6127	-0.0019	0.1854	0.0055	0.1623	-0.0197	0.0373	-0.0091	0.1372
cor	-0.0436	0.5835	-0.0025	0.9551	-0.0093	0.7388	-0.0789	0.4412	-0.0222	0.8123	0.1627	0.0131
rd	-0.0000	0.8913	0.0000	0.2598	0.0000	0.0609	0.0000	0.1881	0.0000	0.9062	0.0000	0.8078
nr	0.1953	0.1252	-0.0220	0.6901	0.1352	0.0021	-0.2988	0.0012	0.0155	0.7383	-0.3705	0.0098
fr	0.0978	0.3703	-0.0320	0.6678	0.1220	0.0017	-0.2596	0.0004	-0.0240	0.7429	-0.0631	0.4376
pr	-0.1064	0.5127	0.1978	<.0001	-0.0651	0.2037	-0.1491	0.2450	0.1575	0.0078	0.0362	0.5208
R-Square	0.1841		0.3747		0.3602		0.4993		0.2980		0.2195	
Adj R-Sq	0.0372		0.2621		0.2450		0.4092		0.1717		0.0790	
F Value	1.25		3.33		3.13		5.54		2.36		1.56	

Firstly, let’s start with the analysis of coefficient significance. There are 9 explanatory variables in total, and the statistics about explanatory variables with significant coefficient in 12 regression models is given in Table10, from which we can easily see that sub-sector structure plays an important role in explaining the regional disparity of input-output coefficients.

Table10. Statistics of explanatory variables with significant coefficient

Input-Output Coefficient	Explanatory Variable with Significant Coefficient
a1,6	asize；rd；fr；pr
a10,10	cor；pr
a12,10	cor；pr
a12,12	output；cor；pr
a12,16	
a12,17	
a13,13	output
a4,14	asize；pr
a5,13	rd；nr；fr
a6,6	asize；nr；fr
a8,8	clr；pr
a9,9	cor；nr

Now, let’s turn to the analysis of coefficient signal. Table11 gives a brief overview of the signal of explanatory variables among 12 regression models, in which statistics about the signal of explanatory variables can also be found.

Table11. Signal of explanatory variables among 12 regression models

Coefficient / Variable	a1,6	a10,10	a12,10	a12,12	a12,16	a12,17	a13,13	a4,14	a5,13	a6,6	a8,8	a9,9	Positive	Negative
output	-	+	+	+	+	-	+	+	-	+	+	+	9	3
asize	-	+	-	-	+	+	-	+	+	-	+	+	7	5
outputr	-	+	+	+	-	+	+	-	-	-	+	+	7	5
clr	+	-	+	+	-	-	+	-	-	+	-	-	5	7
cor	-	-	-	-	+	-	-	-	-	-	-	+	2	10
rd	+	+	+	-	+	+	-	-	+	+	+	-	8	4
nr	-	+	+	+	-	-	+	-	+	-	+	-	6	6
fr	-	-	+	+	+	+	+	-	+	-	-	-	6	6
pr	+	+	-	+	+	-	-	+	-	-	+	+	7	5

4. Conclusion

So far, time-series analysis has been widely applied to input-output coefficients, however, regional disparity does exist and research on its influential factors is of great importance. Based on national and 30 regional input-output tables of China (2002-2007), descriptive statistics analysis is done from three aspects: great change in coefficients at the regional level from 2002 to 2007, comparison between coefficients at the national level and weighted coefficients at the regional level, and classification of scatter diagrams of coefficients.

As for great Change in coefficients at the regional level from 2002 to 2007, we find two extreme cases: (a) The values of coefficients in 2002 equal zero, but are above 0.05 in 2007; (b) The values of coefficients in 2002 are above 0.05, but equal zero in 2007. As to the comparison between coefficients at the national level and weighted coefficients at the regional level, it can be easily found that the difference between national level and weighted level is narrowing from 2002 to 2007. In addition, the scatter diagrams of 103 coefficients are divided into five categories: Group1 includes scatterplots with relatively normal distribution; Group2 contains scatterplots with relatively decentralized distribution; a coefficient whose national value exceeds all values at regional level is called an outlier, and such coefficients are embodied in Group3; Group4 denotes the scatterplots whose dots are close to the x axis and y axis; as for Group5, it consists of scatterplots with some other special outliers.

Then takes coefficients with normal scatterplot distribution whose column sectors belong to industry as examples, by selecting a series of relative indices from scale, technical characteristics, ownership composition and sub-sector structure, regression models are established to find out main influential factors of the regional disparity among input-output coefficients. Analysis consists of two aspects, that is, coefficient significance and coefficient signal.

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